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Myrmecina melonii n. sp., a new ant from Sardinia, with a review of the West Palaearctic *Myrmecina* (Hymenoptera Formicidae)

Abstract - *Myrmecina melonii* **n. sp.**, a probable Sardinian endemic, is described. The combination of short propodeal spines, reddish colour and feeble sculpture distinguishes it from related taxa.

After reexamination of the types of other West Palaearctic *Myrmecina* the following synonymies are proposed: *Myrmecina graminicola* (Latreille, 1802) = *M. graminicola* var. *dentata* Santschi, 1939 **syn. n.**, = *M. graminicola* subsp. *oelandica* Karavaiev, 1930 **syn. n.**, = *M. graminicola* subsp. *gotlandica* Karavaiev, 1930 **syn. n.**

M. atlantis Santschi, 1939 **stat. n.** is considered a valid species, and *M. sicula* André, 1882 is confirmed as a well differentiated taxon. The importance of the shape of the scape base is stressed for easily separating *M. graminicola* from the other three western Palaearctic forms. Short diagnoses and comments on each taxon and a key to the worker caste for the West Palaearctic region are given.

Riassunto - Myrmecina melonii *n. sp., una nuova formica di Sardegna, con una revisione delle Myrmecina paleartiche occidentali.*

Viene descritta *Myrmecina melonii* n. sp., un probabile endemismo sardo. La combinazione di spine propodeali brevi, colore rossiccio e debole scultura la distingue dalle forme vicine.

Dopo aver riesaminato i tipi delle altre *Myrmecina* della regione paleartica occidentale vengono proposte le seguenti sinonimie: *Myrmecina graminicola* (Latreille, 1802) = *M. graminicola* var. *dentata* Santschi, 1939 **n. sin.**, = *M. graminicola* subsp. *oelandica* Karavaiev, 1930 **n. sin.**, = *M. graminicola* subsp. *gotlandica* Karavaiev, 1930 **n. sin.**

M. atlantis Santschi, 1939 **n. stat.** è considerata specie valida, e *M. sicula* André, 1882 è confermata essere un taxon ben distinto. E' sottolineata l'importanza della forma della base dello scapo per distinguere *M. graminicola* dalle altre tre specie paleartiche occidentali. Vengono fornite brevi diagnosi e commenti per ogni taxon e una chiave per le operaie della regione Paleartica occidentale.

Key words: *Myrmecina*, new species, Sardinia, taxonomy, West Palaearctic.

INTRODUCTION

The ant genus *Myrmecina* Curtis, 1829 is still poorly known and includes a large number of undescribed Indo-Australian representatives (Bolton, pers. comm.). Few species live in the temperate regions of the northern hemisphere where they chiefly conduct a hypogaeic life style. The European and Mediterranean taxa have never been revised, and most forms are known just from the outdated original descriptions as poorly defined subspecies of the widespread *M. graminicola* (Latreille, 1802).

Some years ago I received from Carlo Meloni (Cagliari) a series of *Myrmecina* workers collected in southern Sardinia. They seemed to be related to *M. sicula* André, 1882 and to belong to an undescribed species. In this paper I present the description (based also on a second series collected by Meloni himself) of the new taxon, along with a reanalysis of the other forms of *Myrmecina* known from the West Palaearctic.

MEASUREMENTS AND INDICES

Standard measurements and indices (TL, HW, HL, CI, SL, SI, AL) are as defined by Bolton (1987) and have been taken by means of a Wild M3 stereomicroscope with an ocular graticule. A further measurement has been added: PW (Pronotal width): the width of the pronotum measured across the humeri.

DEPOSITORIES

BMNH: The Natural History Museum, London, United Kingdom.
CMPC: Carlo Meloni private collection, Cagliari, Italy.
FRPC: Fabrizio Rigato private collection, Milano, Italy.
IRScNB: Institut Royal des Sciences Naturelles de Belgique, Bruxelles, Belgium
IZUAS: Institute of Zoology, Ukrainian Academy of Science, Kiev, Ukraine
MCSNG: Museo Civico di Storia Naturale "Giacomo Doria", Genova, Italy.
MCSNM: Museo Civico di Storia Naturale, Milano, Italy.
MCZ: Museum of Comparative Zoology, Cambridge, Mass., U.S.A.
MMPC: Maurizio Mei private collection, Roma, Italy.
MNHN: Muséum National d'Histoire Naturelle, Paris, France.
NMB: Naturhistorisches Museum Basel, Switzerland.

Myrmecina melonii n. sp. (figs. 1, 3-4, 8)

DIAGNOSIS. Similar to *M. sicula* and *M. atlantis* Santschi, 1939 in reddish colour and shape of the scape. It may be separated from both by the sculpture, composed of longitudinal rugulae, weakly developed on the alitrunk, superimposed on a faint ground reticulation, and by the short propodeal spines (Figs. 3-4). In *M. sicula* the alitrunk is mostly smooth, contrasting with the matt head; in *M. atlantis* head and alitrunk have strong rugulae with more developed ground reticulation.

HOLOTYPE WORKER: TL 3.2 , HW 0.71, HL 0.72, CI 99, SL 0.64, SI 90, PW 0.48, AL 0.87.

Mandibles distally chiefly smooth with a faint irregular sculpture, basally with some longitudinal rugae and feebly reticulated in the interrugal space. Dentition as in the other taxa examined, i.e. 10 irregular teeth arranged as follows; apical tooth strong, followed by a blunt preapical denticle and a third better developed tooth. The latter is followed by a series of 7 small blunt teeth regularly arranged on the proximal, convex portion of the masticatory margin, the largest tooth of this series is the penultimate, which is followed by a denticle marking the angle between the basal and masticatory margin. Palp formula 4,3. Clypeus smooth with a faint, median incomplete longitudinal keel and the medial raised portion bearing three blunt processes on its front edge. Frontal area slightly impressed and very ill-defined. Head dorsum with longitudinal irregular rugulae diverging posteriad. Spaces between the rugulae finely and superficially reticulate, nearly smooth. Middle oblong area on the front plus sides of the head below the eyes devoid of sculpture except for a very faint, fine reticulum. Frontal lobes long, widely separated and diverging posteriorly. Scape cylindrical and regularly bent near its base. Ventral surface of the head with slightly anteriorly and strongly midward directed parallel rugulae. Compound eye small, with about 12 ommatidia, those forming the marginal ring often incomplete.

Alitrunk in dorsal view longitudinally irregularly rugulose; the rugulae faint and interrupted in the centre of the pronotum, stronger on the mesonotum. Anteriorly, towards the neck the rugulae arch rightward. Finely reticulate ground sculpture recognizable only on the margin of the dorsum and especially on the propodeum; the latter has a mid-dorsal, short, longitudinal carina. Anteropropodeal processes absent from the profile. Propodeal faces separate by a ridge which joins the spines, which are short and dentiform in profile. Declivitous propodeal face smooth. Sides of the alitrunk longitudinally and irregularly rugose with faint ground reticulation.

Petiole with a smooth, margined, anterior face. The rest of it and the postpetiole with some short coarse longitudinal rugulae and feeble ground sculpture. Postpetiole with a nearly smooth dorsum. Gaster smooth and shining, very superficially, but regularly reticulate. Legs smooth; scape with few longitudinal rugulae and distinct hair pits.

Hairs abundant on the body and appendages. They are mostly decumbent on the latters and on the head and gaster; more raised on the alitrunk with long erect humeral setae. On the head there are a few pairs of long setae on the frontal lobes and the lateral margination of the mid-portion of the clypeus. Pubescence absent.

Main colour bright ferrugineous; posterior half of the cephalic dorsum darker; first segment of the gaster brown, with a reddish tinge.

PARATYPE WORKERS: TL 2.9-3.5, HW 0.64-0.76, HL 0.67-0.77, CI 95-100, SL 0.60-0.68, SI 87-96, PW 0.43-0.55, AL 0.75-0.92 (33 measured).

Very similar to the holotype with the following main variations: the alitrunk sculpture appearing either fainter or stronger especially on the pronotum where rugulae may even be complete. Propodeal spines reduced to very blunt teeth in the series from Santádi (Fig. 4). The colour appears rather constant except for few specimens with dorsum of the alitrunk dark reddish and a single one which is very close to a pale *M. graminicola* in tinge.

TYPE MATERIAL. Holotype worker: ITALY, Sardegna, Cagliari, Isola di Sant'Antioco, locality Perdas de Fogu, 180-200 m a.s.l., 3-II-90 legit C. Meloni (MCSNM).

Paratypes: 17 workers with the same data of the holotype; 16 workers: ITALY, Sardegna, Cagliari, Santádi, Ponte Isca, 60-70 m a.s.l., 30-I-1994 legit C. Meloni (BMNH; CMPC; FRPC; IZUAS; MCSNG; MCSNM; MMPC; MCZ; MNHN; NMB).

OBSERVATIONS (Meloni pers. comm.). In both localities the specimens were collected under stones in scattered Mediterranean scrub (*oleo-ceratonion* plant association). The dates of collection might indicate that this ant move down into the ground during the warmer months, when it has been searched for, but never collected.

Myrmecina graminicola (Latreille) (Figs. 7, 9-10)

Formica graminicola Latreille, 1802: 256. Worker, DENMARK

Myrmecina latreillei Curtis, 1829: 265. Male, GREAT BRITAIN. [Synonymy by Mayr, 1855: 421]

Myrmica striatula Nylander, 1849: 40. Worker, RUSSIA. [Synonymy by Mayr, 1855: 421; Nylander, 1856: 96; Forel, 1915: 20; Donisthorpe, 1915: 76; Brown 1951: 106]

Myrmica bidens Foerster, 1850: 50. Syntype worker and female, GERMANY. [Synonymy by Mayr, 1855: 421] [probably lost]

Myrmecina kutteri Forel, 1914: 1. Holotype worker, ITALY: Val Sesia, Varallo (H. Kutter).

[Synonymy by Brown, 1951: 106]
Myrmecina graminicola var. *grouvellei* Bondroit, 1918: 116. Syntype workers and female, FRANCE: Hyères (A. Grouvelle); Menton (C.te de Dalmas) (IRSNB) [Synonymy by Müller, 1923: 81; Brown 1951: 106] [examined]
Myrmecina graminicola var. *dentata* Santschi, 1939: 77. Syntype workers, TUNISIA: Le Kef (Normand) (NMB) [examined]; **n. syn.**
Myrmecina graminicola subsp. *gotlandica* Karavaiev, 1930: 146. Holotype worker, SWEDEN: Gotland (H. Lohmander) (IZUAS) [examined]; **n. syn.**
Myrmecina graminicola subsp. *oelandica* Karavaiev, 1930: 146. Syntype workers and female, SWEDEN: Oeland (H. Lohmander) (IZUAS) [examined]; **n. syn.**

WORKER: TL 2.8-3.7, HW 0.62-0.84, HL 0.65-0.85, CI 92-101, SL 0.54-0.71, SI 81-93, PW 0.40-0.55, AL 0.77-1.02 (60 measured, including the types of the newly synonymised forms).

Sculpture well developed (especially the rugulae on the dorsum of head and alitrunk) and usually coarser than in the other West Palaearctic *Myrmecina*; yet quite variable. Scape nearly always not cylindrical near the base: when seen in dorsal and slightly back view (Fig. 7 'd', 9 'd') appearing about as wide at the proximal bend, where it is ridged in front, as at the apex. Perpendicular to this view it is somewhat flattened (Fig. 9 'f').

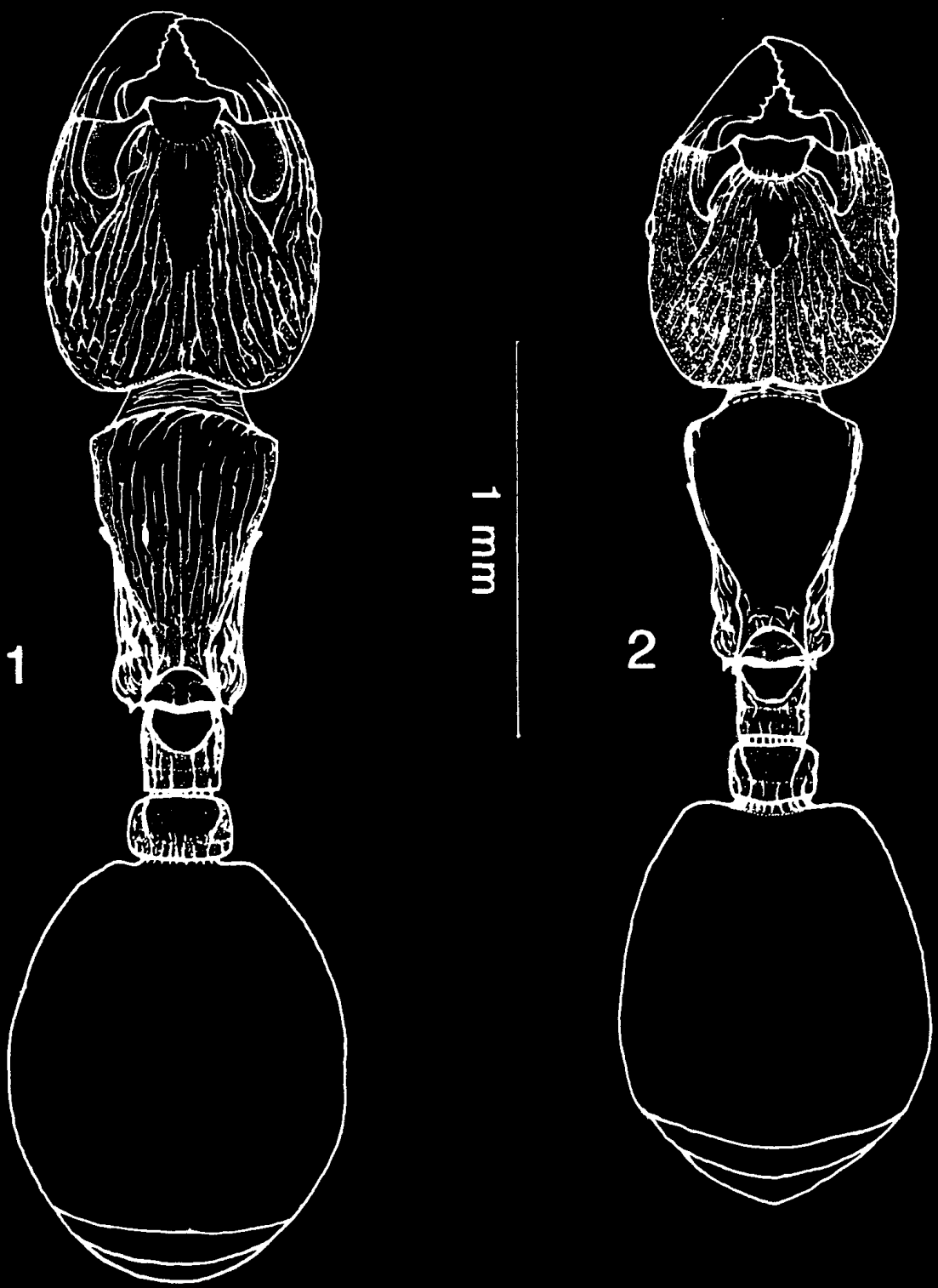
Anteropropodeal processes developed, often a sharp erect tooth in profile.

Colour chiefly dark brown to black; clypeus, sides of the alitrunk, pedicel and II to IV segments of the gaster more or less dark brown or reddish brown. Appendages bright ferrugineous.

COMMENT. *Myrmecina graminicola* subsp. *gotlandica* Karavaiev and *Myrmecina graminicola* subsp. *oelandica* Karavaiev have been characterised by a stronger clypeal sculpture and the complete absence of the medial tooth of the clypeus respectively; the remaining characters are as usual for *M. graminicola*. In my opinion those features represent some mere extremes in structure when compared with specimens coming from the Mediterranean area; I consider such variations concerning the clypeus as quite unreliable for the separation of any form from *M. graminicola*. The median tooth of the clypeus is variable in size and may or not be accompanied by a corresponding weak longitudinal clypeal keel.

The propodeal spines are usually quite long and slightly upward curved near their tip; yet in var. *dentata* Santschi as well as in further specimens the spines are a little shorter and straight (about as in *M. sicula*: Figs. 5-6), consistently with the presumed range of variation of the species.

I think that the main character separating this ant from related forms is the shape of the scape (Fig. 9). In almost all of the *M. graminicola* specimens examined the scape is somewhat dorsoventrally flattened near the base (compare figs. 9 'f' and 9 'd'). If one looks at the scape as in figure 7 'd', it looks clearly about of the same width at its basal bend as at the apex, whereas in *M. sicula*, *M. melonii* (Fig. 8) and *M. atlantis* it remains cylindrical and gradually thickens from the base to the apex as in most ants. However I found few *M. graminicola* specimens from Kefalonia (Faraklata env.) with the scape similar to that of the other Mediterranean species (compare Fig. 10 to Fig. 8); yet in these individuals the body colour is black and not mostly reddish as in the latter. The form described as *M. graminicola* var. *grouvellei* Bondroit, and few other specimens, although having a reddish colour, have the scape shape usual for *graminicola*. Notwithstanding this variation, an ove-



Figs 1-2. *Myrmecina* spp., dorsal views of workers: 1 - *Myrmecina melonii* n. sp., holotype; 2 - *Myrmecina sicula*, lectotype. (Appendages and pilosity omitted).

rall evaluation of spine length, sculpture, colour and scape's shape allows the safe separation of these ants from one another (see descriptions and comments of the other forms).

The pilosity of *Myrmecina graminicola* is usually more raised and longer than in *M. melonii*; however, some specimens from Greece are similar to *M. melonii* on this character. The condition of *M. sicula* and *M. atlantis* seems somewhat intermediate; yet, I have seen few specimens of these species and they often had a partially abraded or poorly preserved pilosity.

Myrmecina graminicola is widespread through the West Palaearctic from Scandinavia to North Africa and from Iberian Peninsula to Middle East at least.

MATERIAL EXAMINED. SWEDEN: Oeland (H. Lohmander); Gotland (H. Lohmander). SPAIN: Jaén, rio Guadalquivir (S. Zoia); Jaén, Bujaraiza env. (S. Zoia). FRANCE: Hyères (A. Grouvelle); Menton (C.te de Dalmas); CORSICA, Brando env. (S. Zoia). SWITZERLAND: Sementina (A. Focarile); Cavergno V. Maggia (A. Focarile). ITALY: LIGURIA, Genova, Mt. Fasce (S. Zoia); Pegli (Rizzerio & Gardini); PIEMONTE, Cuneo, Monteu Roero (G.B. Delmastro); LOMBARDIA, Milano, Monza (F. Rigato); Lecco, Paderno d'Adda (R. Regalin); FRIULI VENEZIA GIULIA, Trieste, Aurisina (R. Sciaky); Udine, Codromaz (C. Torti); Carpeneto (Nazzi); MARCHE, Pesaro, Urbino (Mei & Latella); UMBRIA, Perugia, Mt. Cucco (S. Zoia); LAZIO, Roma, Maccarese (Latella & Mei); Manziana (Mei & Latella); BASILICATA, Potenza, Pietrapertosa (F. Angelini); San Severino Lucano (F. Angelini); Matera, Accettura (F. Angelini); CALABRIA, Cosenza, Monti Orsomarso (F. Angelini); SICILIA, Palermo, Castelbuono (S. Zoia); SARDEGNA, isola di Spargi (Osella); Oristano, Sedilo (Fancello & Leo); Cagliari, Villacidro (P. Leo); Arbus (Fancello & Leo); Silius (Fancello & Leo); Nuoro, Ortuabis (C. Meloni); Baunei (C. Meloni). GREECE: THESSALIA, Mt. Ossa (S. Zoia); Mt. Pilion (S. Zoia); Ioannina, Kalivia (S. Zoia); KERKYRA, Ag. Ioannis (M. Pavesi); KEFALONIA: Chaliotata; Plagiá; Faraklata env.; Strongilos oros (M. Pavesi). TUNISIA: Le Kef (Normand); Tabarka Forêt, Nefza (Meregalli); Ain Draham env. (Meregalli); Ghardimaou Forêt (Meregalli).

Myrmecina sicula André (Figs. 2, 5-6)

Myrmecina latreillei var. *sicula* André, 1882: 275. Syntype workers, ITALY: Palermo (De Stefani) (MNHN, MCSNG) [examined].

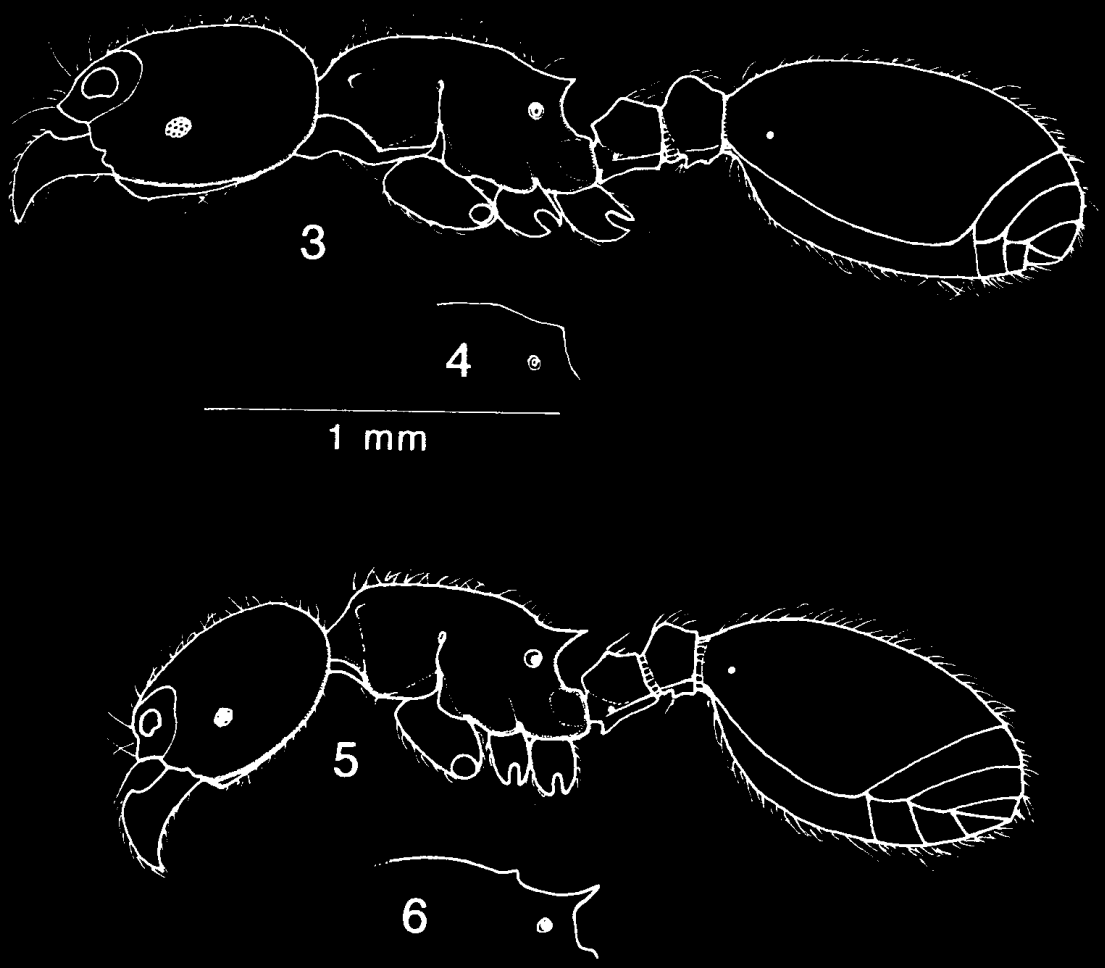
Myrmecina sicula André; Emery, 1916: 59 [raised to species].

As stated by De Stefani (1889) and Emery (1916), the only known specimens of this taxon are the two type workers, of which one is deposited in the MNHN and the other in the MCSNG. For this reason I have preferred to designate as Lectotype the specimen of the MNHN, where André's collection is stored. In this sense I follow the International Code of Zoological Nomenclature (3rd Edition, 1985), Recommendation 74D.

LECTOTYPE WORKER (here designated, specimen deposited in the MNHN): TL 3, HW 0.65, HL 0.68, CI 96, SL 0.57, SI 88, PW 0.44, AL 0.81.

Head mostly opaque, finely reticulate-punctate with superimposed irregular longitudinal rugulae which diverge toward the occiput. The rugulae are clearly less strong than is usual in *M. graminicola*. Alitrunk dorsally with a smooth promesonotum (very faintly superficially reticulate). Propodeum feebly sculptured; sides with longitudinal irregular rugae (as usual for the other species dealt with in the present work). Petiole and postpetiole with few longitudinal rugulae and a weak ground sculpture. Gaster smooth with a very superficial reticulation. Colour bright orange, gaster brown.

PARALECTOTYPE WORKER (specimen with the same data as the lectotype, deposited in the MCSNG): TL 3, HW 0.66, HL 0.69, CI 96, SL 0.56, SI 85, PW 0.44, AL 0.84.



Figs 3-6. *Myrmecina* spp., workers' profiles: 3 - *Myrmecina melonii* n. sp., holotype; 4 - *Myrmecina melonii* n. sp., propodeum of a paratype from Santàdi; 5 - *Myrmecina sicula*, lectotype; 6 - *Myrmecina sicula*, propodeum of the paralectotype. (Sculpture and appendages omitted from Figs. 3 and 5; sculpture and pilosity omitted from Figs. 4 and 6).

The only noteworthy difference from the lectotype are the well developed antero-propodeal processes which rise from the profile of the alitrunk as a low tooth (Fig. 6).

COMMENT. Emery (1916) quite carefully redescribed this ant and raised it to species. He showed the main characters separating *M. sicula* from *M. graminicola*, and stressed the importance of the reduction of the median tooth of the clypeus; as reported above this character is inconsistent. For this reason Menozzi (1936) thought of *M. sicula* as a trivial variant of *graminicola*.

M. sicula appears unique for the contrast between the smooth promesonotum and the dull head, while in the related taxa the head and alitrunk are similarly sculptured.

Unfortunately it seems that the two males reported by De Stefani (1889) have been lost. I hope that some fresh samples of this interesting ant will be collected in the near future.

Myrmecina atlantis Santschi **stat. n.**

Myrmecina graminicola var. *atlantis* Santschi, 1939: 77. Syntype workers, ALGERIA: Philippeville; Bône (Normand); TUNISIA: Aïn Draham (F. Santschi); Le Kef (Normand) (NMB) [examined].

WORKER: TL 2.7-3.4, HW 0.64-0.77, HL 0.66-0.77, CI 96-100, SL 0.56-0.63, SI 82-89, PW 0.43-0.50, AL 0.77-0.90. (13 measured)

Head longitudinally and irregularly rugulose, or coarsely reticulate-rugulose, ground sculpture more or less strongly reticulate-punctulate. Alitrunk with well developed and sharply defined irregular longitudinal rugulae, ground sculpture somewhat weaker than that on the head. Anteropropodeal processes more or less protruding in profile. Propodeal spines very similar to those of *M. graminicola*.

Colour reddish, with a mostly brown gaster and sometimes a rather darkened head.

COMMENT. For its sculpture this ant might be confused with a pale *M. graminicola*, but it shares the scape's shape of *M. sicula* and *M. melonii* (Fig. 8). Yet, as some *M. graminicola* may have a cylindrical scape (Fig. 10), one can doubt about the separation of *atlantis* as a distinct form. However, I have seen specimens exactly corresponding to the usual dark *graminicola* (also in scape's shape) and to the paler *atlantis* coming from the same localities of Tunisia; so these ants often appear to be sympatric without intermediates. *M. melonii* is also similar, but has much shorter and dentiform propodeal spines and much less strong longitudinal rugulae on the alitrunk.

MATERIAL EXAMINED. ALGERIA: Philippeville, X-1930 & X-1929 (Normand); Bône (Normand); TUNISIA: Aïn Draham (F. Santschi); Le Kef (Normand); Ghardimaou Forêt (Meregalli)

KEY TO THE WEST PALAEARCTIC SPECIES OF THE GENUS *MYRMECINA* (WORKERS)

1 - Base of the scape usually somewhat dorso-ventrally flattened: in postero-dorsal view (Fig. 7 'd') its basal bend appears about as thick as the apex (Fig. 9 'd'). Sculpture strong, head and alitrunk distinctly longitudinally rugulose. Main body colour usually dark brown to black; if somewhat reddish, the shape of the scape is as above. (Widespread in the western Palaearctic region) *M. graminicola*

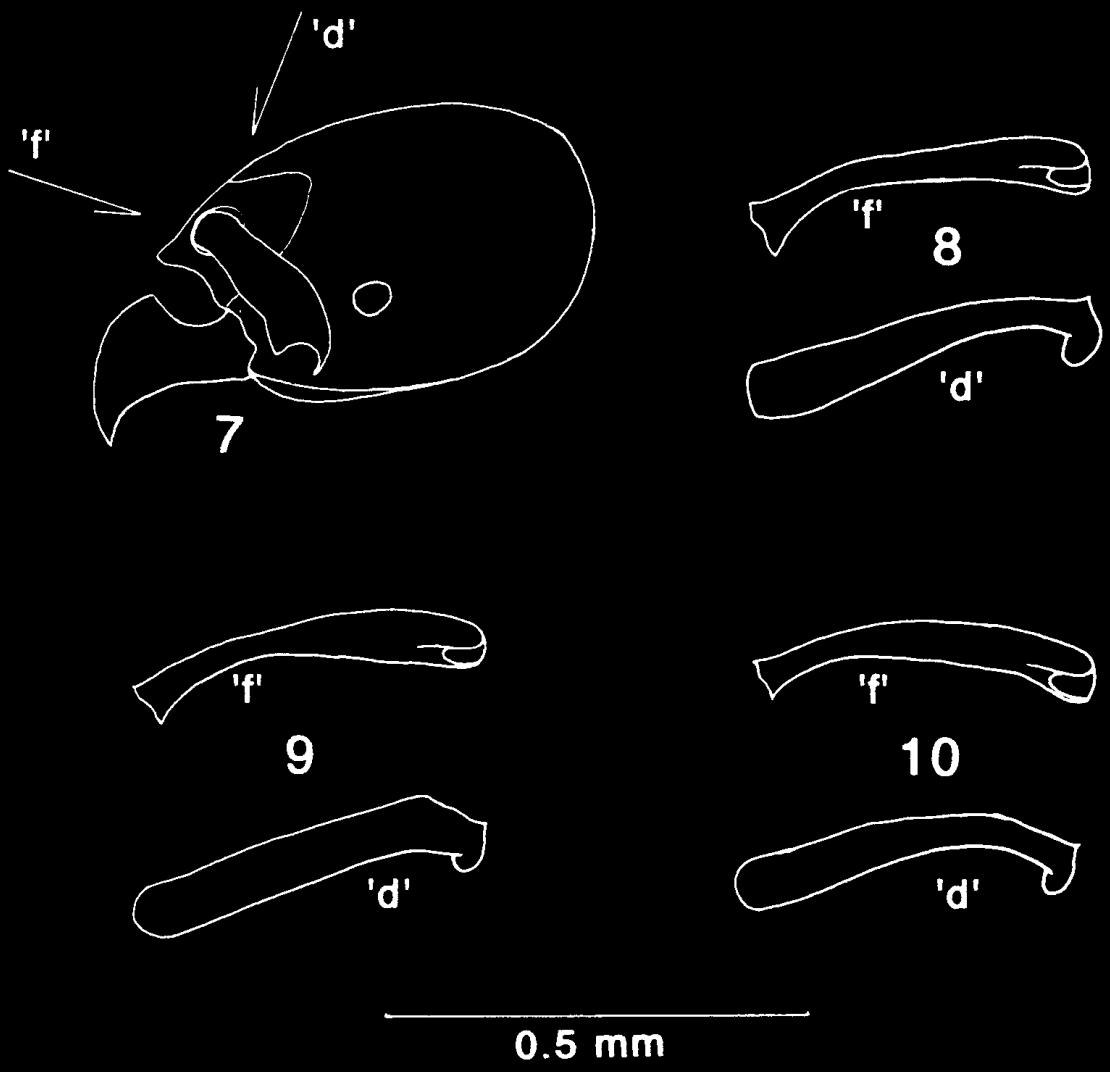
\- Base of the scape always cylindrical (Fig. 8), distinctly thinner than the apex when seen as in fig. 7 'd'. Sculpture variable, especially on the alitrunk, where it may be concealed or feeble at least on the pronotum. Main body colour reddish, with dorsum of the head and gaster often darkened. 2.

2 - Dorsum of the alitrunk mostly smooth, only the propodeum and margins of the promesonotum weakly sculptured. In contrast, head longitudinally rugulose and subopaque; spaces between the rugulae strongly reticulate-punctate. (Italy: Sicily) *M. sicula*

\- Dorsum of the alitrunk longitudinally rugulose or rugose. Head mostly longitudinally rugulose; spaces between the rugulae more or less densely reticulate, often subshiny. 3.

3 - Propodeal spines well developed, sharp. Pronotum always and distinctly longitudinally rugulose. Sculpture coarser, strongly rugulose, usually with clearly developed ground reticulate puncturation. (Tunisia, Algeria) *M. atlantis*

\- Propodeal spines short, dentiform, often blunt (Figs. 3-4). Pronotum mostly smooth with weak longitudinal rugulae. Sculpture finer, less strongly rugulose, usually with quite feeble ground reticulate puncturation. (Italy: Sardinia) *M. melonii* n. sp.



Figs 7-10. *Myrmecina* spp., workers' details: 7 - *Myrmecina graminicola*, head profile of a worker with scape, indicating 'd' (dorsal) and 'f' (frontal) views for evaluating the scape's shape; 8 - *Myrmecina melonii* n. sp., scape; 9 - *Myrmecina graminicola*, scape, usual shape; 10 - *Myrmecina graminicola*, scape, unusual shape of some specimens from Kefalonia. (Sculpture and pilosity omitted).

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